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Reply under 37 CFR 1.116
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REMARKS

Claims 1-21 were pending and considered. Claims 1-21 were rejected. In response, claims 1 and 12 have been amended. Entry of this amendment after final rejection, reconsideration and allowance are respectfully requested.

Claims 1-10 have been rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative under 35 U.S.C. 103(a) as being obvious from U.S. Patent 6,073,865 (Kriebel et al.). In response thereto, claim 1 has been amended. Accordingly, applicant submits that claim 1, and claims 2-10 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

Kriebel et al. teaches a process and an apparatus for carrying out the process for efficiently disintegrating and raising the temperature of a friable material. The embodiment shown in Fig. 8 is used to treat a plug 1 from a thickening press 2. The apparatus includes a stator 15 and rotor 16, with a first pulverizing element 17 mounted in the center of rotor 16 to rasp off and distribute small pieces of the material. Primary stator teeth 22 are provided to retard the material and increase the material retention time in a vapor chamber 18 between primary stator teeth 22 and a disperser zone 19. A super heated vapor ST is provided to vapor chamber 18 for heating the material.

The process and apparatus of Kriebel, et al. are is used to disintegrate and disperse ink particles in recycled waste paper. Particles that can not be removed easily from the fiber are broken into small pieces so that the particles are less noticeable and less easily detected in the paper end product. Steam is used to heat the pulp such that the fibers and ink particles attached hereto are made more flexible. In the dispersion zone, the fibers are rubbed one against another so that any contaminants thereon are dispersed into very little pieces or are rubbed off the fiber.

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In a treatment process after the dispersion process, the contaminants can be filtered or screened out. To make such a dispersion process work, a radial gap not greater than about 3 millimeters is needed (claim 23). With such a narrow gap between discs, high energy is needed, thus making the dispersion process a high shear process. Any such high shear process, such as dispersion or refining, changes the fiber characteristics by defibrillation, resulting in mechanical fiber property changes.

In contrast to the teaching of Kriebel et al., claim 1, as amended recites in part an apparatus for loading fibers with calcium carbonate, the apparatus having:

"... a rotor and stator assembly positioned within said housing radially outside of said distribution member, including a rotor and stator in opposed relationship defining a gap therebetween, said gap being between approximately 25 mm and 100 mm;" (Emphasis added.)

Applicant submits that such an invention is neither taught, disclosed nor suggested by Kriebel, et al., and the present invention has distinct advantages over the prior art.

Kriebel, et al. teaches a process and a device requiring a high shear. Close gaps (less than 3mm spacing) between teeth of the treatment plates are provided to cause mechanical interaction between fibers, thereby detaching and dispersing contaminants such as ink. Kriebel et al. does not teach an apparatus for loading fibers with calcium carbonate, with a rotor and stator assembly including a rotor and stator in opposed relationship defining a gap therebetween of between about 25 mm and 100 mm. The present invention teaches a low shear apparatus, as evidenced by the wide spacing between the rotor and stator, just opposite to the high shear process and apparatus of Kriebel et al. The wide spacing of the present invention that does not create significant fiber to fiber mechanical interaction. Any such close interaction between fibers would change the

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crystallization process used in fiber filling. To achieve optimal crystal growth, the pulp fibers must stay fluffed. To retain this physical characteristic of the fibers, a wide gap, low shear apparatus is required. Clearly Kriebel et al does not teach such a device, and claim 1 is not anticipated by the teaching of Kriebel et al. Further, it is respectfully submitted that the teaching of a high shear apparatus and process, such as Kriebel et al, which specifically requires high shear treatment of pulp to dislodge and disintegrate contaminants on the pulp fibers, does not render obvious the use of a refiner in a low shear configuration, with wide stator to rotor spacing, for use in fiber filling processes, as recited in amended claim 1.

The present invention includes advantages over the prior art. The apparatus functions to improve productivity in a chemical loading process for fiber suspensions. The apparatus provides fiber loading in a continuous manner by improving output quantities of a loaded fiber suspension. The rotor and stator assembly adequately distributes the calcium carbonate crystals within the fiber suspension. For these reasons, it is respectfully submitted that independent claim 1 recites an invention not taught by Kriebel et al. and that independent claim 1 together with dependent claim 2-10 should be allowed.

Claims 4 and 12-20 have been rejected under 35 U.S.C. sections 103(a) as being unpatentable over Kriebel et al. in view of U.S. Patent 4,684,073 (Berggren). In response thereto, claim 12 has been amended. Accordingly, applicant submits that claim 4, which depends from claim 1 discussed above, and claim 12 along with claims 13-20 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

The summary and analysis of the teaching of Kriebel et al., as applied to claim 1 above, is incorporated herein with respect to this rejection.

Berggren teaches a combined thickener and refiner that includes a screw press thickener 1

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and a refiner 2. Screw press thickener 1 has a pulp inlet 3 and an outlet 4 for water pressed from the pulp. A screening jacket 5 is provided with drainage holes to remove water and thicken the material conveyed by screw 6. Refiner 2 includes a central inlet passage 7 to a central cavity 8 in which a propeller-like means 9 is provided for degrading and distributing the incoming material. Material from cavity 8 moves outwardly through holes 10 into beating zone 12 between a rotor 11 and a stator 13. A screw 14 removes refined material.

In contrast to the teachings of Kriebel, et al. and Berggren, claim 1, as amended, recites, in part:

“... a rotor and stator assembly positioned within said housing radially outside of said distribution member, including a rotor and stator in opposed relationship defining a gap therebetween, said gap being between approximately 25 mm and 100 mm;” (Emphasis added.)

In further contrast to the teachings of Kriebel et al. and Berggren, claim 12 recites:

“... a rotor and stator assembly positioned within said housing radially outside of said distribution cross, including a rotor and stator in opposed relationship defining a gap therebetween, said gap being between approximately 25 mm and 100 mm;” (Emphasis added.)

Applicant submits that such an invention is neither taught, disclosed nor suggested by Kriebel, et al. nor Berggren, nor the combination thereof, and the present invention has distinct advantages over the prior art.

Kriebel et al. teaches a process and a device requiring and providing high shear treatment of pulp, as summarized above. Close gaps (less than 3mm spacing) between the teeth of treatment plates are provided to cause mechanical interaction between fibers, thereby detaching

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and dispersing contaminants such as ink held thereon. Berggren also teaches a refiner in a combined apparatus including a screw press. Neither Kriebel et al. nor Berggren, alone or in combination teaches an apparatus for loading fibers with calcium carbonate with a rotor and stator assembly including a rotor and stator in opposed relationship defining a gap therebetween, the gap being between about 25 mm and 100 mm. The present invention is a low shear apparatus, as evidenced by the wide spacing between the rotor and stator, just opposite to the high shear process and apparatus of Kriebel et al. Berggren does not make-up the deficiency in the teaching of Kriebel et al. The wide spacing between the rotor and stator of the present invention does not create fiber to fiber mechanical interaction. Any such close interaction between fibers would change the crystallization process used in fiber filling in a negative way. To achieve optimal crystal growth the pulp fibers must stay fluffed. To retain this physical characteristic of the fibers, a wide gap, low shear apparatus is required. Neither Kriebel et al nor Berggren alone or in combination teaches such a device.

The present invention includes advantages over the prior art. The apparatus functions to improve productivity in a chemical loading process for fiber suspensions. The apparatus provides fiber loading in a continuous manner by improving output quantities of a loaded fiber suspension. The rotor and stator assembly adequately distributes the calcium carbonate crystals within the fiber suspension. For these reasons, it is respectfully submitted that independent claims 1 and 12 recite an invention not taught by Kriebel et al nor Berggren, nor the combination thereof, and that claim 4 which depends from independent claim 1 and claim 12 together with dependent claim 13-20 should be allowed.

Claims 1-21 have been rejected under 35 U.S.C. section 103(a) as being unpatentable over Kriebel et al. as necessary with Berggren and further in view of U.S. Patent 5,223,090 (Klungness

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et al.). In response thereto, claims 1 and 12 have been amended. Accordingly, applicant submits that claims 1 and 12, along with claims 2-11 and 13-21 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

The previous analyses herein of the teachings of Kriebel et al. and Berggren are incorporated also with respect to this rejection.

Klungness et al. teaches a fiber loading process using high shear mixing. Klungness et al. specifically teaches that high shear is required. For example, Klungness, et al, states:

It has also been determined that for fibers containing from about 95% to about 85% of moisture (5% to 15% of fiber) and the same calcium oxide loading, that high shear treatment during contact with the carbon dioxide is required to cause complete precipitation of calcium carbonate. In this connection, any suitable high shear mixing device can be used. (Klungness, et al, column 7, lines 6-12.)

Klungness et al further states:

It has been determined that a simple way to provide contact of the carbon dioxide with the paper pulp under high shear treatment is by means of a pressurized refiner. (Klungness et al., column 7, lines 16-19)

In contrast to the teachings of Kriebel et al., Berggren and Klungness et al., claim 1 as amended, recites in part:

"... a rotor and stator assembly positioned within said housing radially outside of said distribution member, including a rotor and stator in opposed relationship defining a gap therebetween, said gap being between approximately 25 mm and 100 mm;" (Emphasis added.)

In further contrast to the teachings of Kriebel et al., Berggren and Klungness et al., claim 12 as amended recites in part:

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“... a rotor and stator assembly positioned within said housing radially outside of said distribution cross, including a rotor and stator in opposed relationship defining a gap therebetween, said gap being between approximately 25 mm and 100 mm;” (Emphasis added.)

Applicant submits that such an invention is neither taught, disclosed nor suggested by Kriebel, et al., Berggren nor Klungness, et al., nor any combination thereof, and the present invention has distinct advantages over the prior art.

Kriebel, et al. teaches a process and a device requiring a high shear. Close gaps (less than 3mm spacing) between teeth of the treatment plates are provided to cause mechanical interaction between fibers, thereby detaching and dispersing contaminants such as ink. Berggren teaches a refiner in a combined apparatus including a screw press. Klungness, et al. teaches a high shear process using a refiner specifically because a refiner will impart the high shear treatment that Klungness, et al determined was necessary. Neither Kriebel et al., Berggren nor Klungness, et al., alone or in combination teaches an apparatus for loading fibers with calcium carbonate with a rotor and stator assembly including a rotor and stator in opposed relationship defining a gap therebetween of between about 25 mm and 100 mm. The present invention teaches a low shear apparatus that does not create fiber to fiber mechanical interaction. Any such close interaction between fibers would change the crystallization process used in fiber filling in a negative way. To achieve optimal crystal growth the pulp fibers must stay fluffed. To retain this physical characteristic of the fibers, a wide gap, low shear apparatus is required, and one skilled in the art would not look to the high shear apparatuses of the prior art for performing the fiber filling process.

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The present invention includes advantages over the prior art. The apparatus functions to improve productivity in a chemical loading process for fiber suspensions. The apparatus provides fiber loading in a continuous manner by improving output quantities of a loaded fiber suspension.

The rotor and stator assembly adequately distributes the calcium carbonate crystals within the fiber suspension. For these reasons, it is respectfully submitted that independent claims 1 and 12 recite an invention not taught by Kriebel et al., Berggren or Klungness, et al alone or in combination and that independent claims 1 and 12 should be allowed. For these same reasons, claims 2-11 depending from claim 1, and claims 13-21 depending from claim 12 also should be allowed.

Applicant has amended the independent claims to clearly recite a gap spacing well beyond that suggested by Kriebel, et al. Whereas the Examiner has suggested that any gap is a mere optimization of the Klungness et al. process, it is respectfully submitted that applicant's process is much more than that. Klungness specifically teaches that high sheer mixing is required and suggests that a pressurized refiner can be used because it provides the necessary high shear treatment. In contrast, the present application teaches a low sheer process as disclosed by the wide gap claimed between the rotor and stator. Applicant has determined that a refiner, can be used in low shear conditions to perform fiber loading. It is respectfully submitted that none of the prior art teaches or suggests a pressurized refiner with the gap as claimed for use with a toothed ring and a reactant gas supply coupled with the gas ring. Reconsideration and allowance of all claims 1-21 are respectfully requested.

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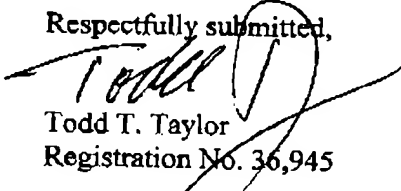
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For the foregoing reasons, Applicant submits that no combination of the cited references teaches, discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicant respectfully requests entry of this amendment after final rejection, withdrawal of all rejections and allowance of the claims.

In the event Applicant has overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicant hereby conditionally petitions therefor and authorizes that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,


Todd T. Taylor
Registration No. 36,945

Attorney for Applicant

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being transmitted via facsimile to the U.S. Patent and Trademark Office, on: May 6, 2003.

Todd T. Taylor, Reg. No. 36,945

Name of Registered Representative


Signature

May 6, 2003

Date

TTT/aj

TAYLOR & AUST, P.C.
142 S. Main Street
P.O. Box 560
Avilla, TN 46710
Telephone: 260-897-3400
Facsimile: 260-897-9300

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